

CLAIMS

- 1 1. A method for diagnosing faults in a system under test (SUT), the SUT defining
2 data transmission paths through which data are transferred, said method comprising:
3 identifying at least some portions of the data transmission paths of the SUT
4 capable of introducing errors in data transfer;
5 providing constraints defining relationships of at least some of the portions of
6 the data transmission paths identified; and
7 diagnosing the SUT with respect to the constraints.
- 1 2. The method of claim 1, wherein identifying comprises providing a dataflow
2 model corresponding to the SUT, the dataflow model including edges, each of which
3 corresponds to a portion of one of the data transmission paths of the SUT capable of
4 introducing errors in data transfer.
- 1 3. The method of claim 2, wherein the dataflow model includes vertices, each of
2 the edges being defined between two of the vertices.
- 1 4. The method of claim 3, wherein each of the vertices is at least one of a
2 termination of an edge and representative of a location where an operation with
3 respect to data can occur.
- 1 5. The method of claim 4, wherein the operation corresponding to a vertex
2 includes at least one of dropping data, splitting data, routing data, replicating data and
3 combining data.

- 1 6. The method of claim 4, further comprising:
2 receiving test results corresponding to the SUT; and
3 wherein diagnosing comprises analyzing the test results with respect to the
4 dataflow model.
- 1 7. The method of claim 6, wherein the SUT includes counters corresponding to
2 at least some of the edges of the dataflow model; and
3 further comprising:
4 receiving information, corresponding to the test results, from at least some of
5 the counters.
- 1 8. The method of claim 6, wherein the dataflow model is a directed graph.
- 1 9. The method of claim 6, wherein analyzing the test results comprises:
2 receiving information corresponding to failed data transfers; and
3 identifying portions of the SUT potentially associated with the failed data
4 transfers.
- 1 10. The method of claim 9, wherein analyzing the test results comprises:
2 exonerating portions of the SUT initially identified as being associated with
3 the failed data transfers if those portions of the SUT are determined not to have
4 initiated at least one of the failed data transfers.

1 11. The method of claim 1, wherein diagnosing the SUT comprises:
2 receiving information regarding data transfers with respect to the
3 portions identified, the information being obtained via cyclic redundancy checking.

1 12. The method of claim 1, wherein identifying comprises providing a dataflow
2 model corresponding to the SUT, the dataflow model including edges and vertices,
3 each of the edges corresponding to a portion of one of the data transmission paths of
4 the SUT capable of introducing errors in data transfer, each of the edges being defined
5 between two of the vertices; and
6 wherein the constraints correspond to data flow characteristics of the SUT
7 exhibited with respect to the vertices.

1 13. The method of claim 12, wherein at least one of the constraints of at least one
2 of the vertices relates that an amount of data flowing into the vertex corresponds to an
3 amount of data flowing from the vertex.

1 14. The method of claim 13, wherein the amount of data flowing into the vertex
2 corresponds to an amount of at least one of: good data, bad data and a particular type
3 of data flowing into the vertex.

1 15. A method for diagnosing faults in a system under test (SUT), said method
 2 comprising:
 3 providing a dataflow model representative of the SUT; the dataflow model
 4 including information corresponding to a relationship of error detection capabilities of
 5 the SUT; and
 6 diagnosing the SUT with respect to the dataflow model.

1 16. The method of claim 15, wherein diagnosing the SUT comprises:
 2 providing constraints defining relationships of at least some of the portions of
 3 the dataflow model.

1 17. The method of claim 15, wherein diagnosing the SUT comprises:
 2 generating information indicative of a manner of failure of the SUT.

1 18. The method of claim 17, wherein the flow of data is a flow of data packets;
 2 and
 3 wherein diagnosing the SUT further comprises:
 4 analyzing information acquired via cyclic redundancy checks
 5 performed at various locations associated with the flow of data.

1 19. The method of claim 15, wherein the dataflow model lacks procedural content
 2 and process calls.

1 20. A system for diagnosing faults in a system under test (SUT), said system
 2 comprising:
 3 a dataflow model representative of error detection capabilities of the SUT; and
 4 a reasoning engine associated with said dataflow model, said reasoning engine
 5 being adapted to evaluate test results corresponding to the SUT in relation to said
 6 dataflow model.

1 21. The system of claim 19, wherein said dataflow model is a directed graph
 2 including edges and vertices, each of said edges corresponding to at least a portion of
 3 a data transmission path of the SUT through which an error can be introduced, each of
 4 said edges being defined by two of said vertices.

1 22. The system of claim 19, wherein said reasoning engine is adapted to evaluate
 2 the test results of the SUT with respect to constraints, the constraints defining
 3 relationships of at least some of the portions of the dataflow model.

1 23. The system of claim 19, wherein said reasoning engine is adapted to receive
 2 information corresponding to failed data transfers and identify portions of the SUT
 3 potentially associated with the failed data transfers.

1 24. The system of claim 19, further comprising:
 2 an SUT communicatively coupled to at least one of said dataflow model and
 3 said reasoning engine.

10070047 024900

1 25. A system for diagnosing faults in a system under test (SUT), said system
2 comprising:
3 means for receiving test results corresponding at least some portions of data
4 transmission paths of the SUT; and
5 means for diagnosing the SUT with respect to constraints defining
6 relationships of at least some of the portions of data transmission paths of the SUT.

1 26. The system of claim 25, wherein said means for diagnosing includes means for
2 analyzing the SUT with respect to a dataflow model.

1 27. The system of claim 25, further comprising:
2 means for testing the SUT to generate test results.

1 28. A diagnosis system stored on a computer-readable medium, the diagnosis
2 system being adapted to diagnose faults in a system under test (SUT), said diagnosis
3 system comprising:
4 logic configured to identify at least some portions of the data transmission
5 paths of the SUT capable of introducing errors in data transfer;
6 logic configured to provide constraints defining relationships of at least some
7 of the portions of the data transmission paths; and
8 logic configured to diagnose the SUT with respect to the constraints.

1 29. The diagnosis system of claim 28, wherein said logic configured to diagnose
2 comprises:

3 logic configured to provide a dataflow model; and

4 logic configured to analyze the SUT with respect to a dataflow model.

1 30. The diagnosis system of claim 28, wherein said logic configured to diagnose
2 includes logic configured to generate information indicative of the flow of data
3 associated with a time of error detection.

1 31. The diagnosis system of claim 28, wherein said logic configured to diagnose
2 includes logic configured to identify portions of the SUT potentially associated with
3 failed data transfers.

1 32. The diagnosis system of claim 31, wherein said logic configured to diagnose
2 includes logic configured to exonerate components initially identified as being
3 associated with the failed data transfers.

10078847 021903